REMARKS

In the Office Action[1], the Examiner rejected claims 1-13 under 35 U.S.C. § 102(b) as being anticipated by Tsudaka (U.S. Patent No. 6,249,597 B1, "Tsudaka"); and rejected claims 1-13 under 35 U.S.C. § 102(e) as being anticipated by Tanaka et al. (U.S. Patent No. 6,536,032 B1, "Tanaka") or Hatada et al. (U.S. Patent No. 6,811,953 B2, "Hatada"). Claims 14-20 are withdrawn and thus claims 1-13 remain under examination.

By this amendment, Applicants have amended claims 1, 3, 5, 8, 9-13. Applicants have amended claims 1, 3, 5, 8, and 11 to even more clearly define the present invention. Support for the amendments to claims 1 and 8 can be found, for example, at pages 14-22 describing Figs. 1-3 of Applicants' specification. Support for the amendments to claims 3 and 11 can be found, for example, at pages 22-26 describing Figs. 4 and 5 of Applicants' specification. Support for the amendment of claim 5 can be found, for example, at pages 26-29 describing Fig. 6 of Applicants' specification. Claims 9, 10, 12, and 13 have been amended to correct minor typographical errors.

Applicants respectfully traverse the rejection of claims 1-13 under 35 U.S.C. § 102(b) as being anticipated by Tsudaka. In order to support a rejection under 35 U.S.C. § 102, each and every element of each claim in issue must be found, either expressly described or under principles of inherency, in that single reference. Furthermore, "[t]he identical invention must be shown in as complete detail as is

1 The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicants decline to automatically subscribe to any statement or characterization in the Office Action.

contained in the ... claim." *See* M.P.E.P. § 2131, quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989). Applicants respectfully traverse the rejection, as the cited reference does not teach each and every element of independent claim 1.

Claim 1 recites an exposure method including:

> calculating a first exposure quantity to be applied to the first mask from the exposure curve to provide a first resist pattern;
>
> simulating an optical intensity distribution on a wafer in a case where the first mask is used and an optical intensity distribution on the wafer in a case where a second mask is used, a size of a mask pattern of the second mask being measured in advance;
>
> calculating a difference in optical intensity between the first mask and the second mask from the simulated optical intensity distributions; and
>
> calculating a second exposure quantity to be applied to the second mask to provide a second resist pattern, from the first exposure quantity and the difference in optical intensity

(emphasis added.)

Tsudaka discloses generating evaluation points that are prepared "by the evaluation point arranging means 8 based on the design pattern stored in the design pattern storing means 4 shown in Fig. 1" and then measuring "deviation with respect to the design pattern of the resist edge." Col. 8, lines 36-41 and Fig. 2. A "transfer resist pattern (transfer image) is calculated by the simulation means 10," and the deviation of the "resist edge with respect to the design pattern is calculated for each evaluation point." Col. 8, line 66 - col. 9, line 9. As shown in step S14 of Fig. 2 and described at column 9, lines 23-36, of Tsudaka, the design pattern 32 is "deformed and corrected by

the deforming means 14 . . . in accordance with the deviations" by moving the "boundary lines . . . of the mask pattern in the vicinity of the evaluation points 30 . . . exactly by amounts obtained by multiplying the amounts of differences by constant coefficients in a reverse direction of the deviations." Tsudaka further teaches that the "corrected design pattern is stored in the correction pattern storing means 16 . . . the corrected mask pattern" being outputted to a "screen or sheet or film by outputting means 20." Col. 9, lines 47-53. Thus, Tsudaka teaches creating an evaluation pattern, and based on simulations of the pattern, calculating a deviation which is used to deform a mask pattern to create a corrected mask pattern stored in a corrected pattern storage means.

However, Tsudaka fails to teach or suggest "calculating a first exposure quantity to be applied to the first mask from the exposure curve to provide a first resist pattern. . . [and] calculating a second exposure quantity to be applied to the second mask to provide a second resist pattern, from the first exposure quantity and the difference in optical intensity," (emphasis added) as recited in claim 1. Accordingly, claim 1 is not anticipated by Tsudaka at least because the reference fails to teach or suggest "calculating a first exposure quantity" and "calculating second exposure quantity . . . from the first exposure quantity and the difference in optical intensity," as recited in claim 1.

Claim 1 is thus allowable over Tsudaka. Independent claims 3 and 5 recite similar limitations to claim 1 and are allowable for at least the same reason as discussed above with respect to claim 1. In addition, claims 2, 4, and 6 and 7,

respectively depend from allowable independent claims 1, 3, and 5 and are allowable at least due to their dependence.

Applicants respectfully traverse the rejection of claim 8. Claim 8 recites an exposure device in which:

> an optimum exposure quantity to be applied to the first mask is calculated from [an] exposure curve to provide a first resist pattern corresponding to the mask pattern of the first mask;
>
> an optical intensity distribution on a wafer in a case where the first mask is first used and an optical intensity distribution on the wafer in a case where a second mask having a mask pattern is later used, are simulated;
>
> a difference in optical intensity between the first mask and the second mask is calculated from the simulated optical intensity distributions by the optical intensity distribution simulating unit, and
>
> an optimum exposure quantity to be applied to the second mask is calculated from the optimum exposure quantity to be applied to the first mask and the difference in optical intensity by the exposure condition calculating unit to provide a second resist pattern corresponding to the mask pattern of the second mask

(emphasis added).

In contrast, as described above Tsudaka discloses "generat[ing] evaluation points . . . calculat[ing a] transfer resist pattern . . . measur[ing] the deviation with respect to the design pattern", and then moving the mask edge in response to the deviation to produce a "corrected design pattern." See Fig. 2, steps S11 - S12 as described at col. 8, line 23 - col. 9, line 53 of Tsudaka.

However, Tsudaka fails to teach or suggest "an optimum exposure quantity to be applied to the first mask" and "an optimum exposure quantity to be applied to the second mask calculated from the optimum exposure quantity to be applied to the first

mask and the difference in optical intensity by the exposure condition calculating unit to provide a second resist pattern corresponding to the mask pattern of the second mask," (emphasis added) as recited in claim 8. Accordingly, claim 8 is not anticipated by Tsudaka at least because the cited reference fails to teach or suggest each and every element recited in claim 8.

Claim 11 recites similar limitations to claim 8 and is allowable for similar reasons to those discussed above with respect to claim 8 over Tsudaka. Claim 9, 10, 12, and 13 depend from their corresponding independent claim 8 and 11, and are allowable at least due to their dependence over Tsudaka. Thus, claims 8-13 are not anticipated by Tsudaka. Claims 1-7 are allowable over Tsudaka for the reasons discussed above. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw his rejection of claims 1-13 based on Tsudaka.

Applicants respectfully traverse the rejection of claims 1-13 under 35 U.S.C. § 102(e) as being anticipated by Tanaka or Hatada. Neither Tanaka nor Hatada teach or suggest each and every element recited in claims 1-13 as discussed below.

Tanaka discloses "a method of simulating an optical image, using an exposure mask . . . [and] increasing the accuracy of predicting the simulated shapes of the corners of mask patterns." Col. 1, lines 16-20, emphasis added. Hatada discloses "a multi-scanning projection exposure apparatus . . . which projection exposes the pattern of a mask onto a photosensitive substrate while moving a mask and the photosensitive substrate relative to a projection optical system . . . [including] a plurality of reflection/refraction projection optical modules." Col. 1, lines 13-20, emphasis added.

However, neither Tanaka nor Hatada teach or suggest "calculating a first exposure quantity to be applied to the first mask from the exposure curve to provide a first resist pattern. . . [and] calculating a second exposure quantity to be applied to the second mask to provide a second resist pattern, from the first exposure quantity and the difference in optical intensity," (emphasis added) as recited in claim 1. Furthermore, neither Tanaka nor Hatada disclose "an optimum exposure quantity to be applied to the first mask" and "an optimum exposure quantity to be applied to the second mask" an as recited in claim 8.

As discussed above, claims 3, 5, and 11 recite similar limitations to those recited in claims 1 or 8. Claims 3, 5, and 11 are thus also allowable over Tanaka and Hatada for reasons similar to those discussed above with respect to claims 1 and 8. Furthermore, claims 2, 4, 6 and 7, 9 and 10, and 12 and 13, which respectively depend from independent claims 1, 3, 5, 8, and 11, are allowable at least due to their respective dependence. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 1-13 under 35 U.S.C. § 102(e) as being anticipated by Tanaka or Hatada because neither reference teaches or suggests each and every element recited in claims 1-13.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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